

This report not to be quoted without prior reference to the Council*

International Council for the
Exploration of the Sea

C.M.1990/Assess:16

PART 2

REPORT OF THE WORKING GROUP ON NEPHRODS STOCKS

Nantes, France, 21-28 March 1990

This document is a report of a Working Group of the International Council for the Exploration of the Sea and does not necessarily represent the views of the Council. Therefore, it should not be quoted without consultation with the General Secretary.

*General Secretary
ICES
Palægade 2-4
DK-1261 Copenhagen K
Denmark

Table 4.1. - Nephrops management units

No.	Name	ICES Division
1	Iceland - South coast	Va
2	Faroe Islands	Vb
3	Skagerrak	IIIa
4	North and Central Kattegat	IIIa
5	Botney Gut and Silver Pit	IVb,c
6	Farn Deeps	IVb
7	Fladen Ground	IVa
8	Firth of Forth	IVb
9	Moray Firth	IVb
10	Noup	IVb,VIa
11	North Minch	VIa
12	South Minch	VIa
13	Clyde	VIa
14	Irish Sea East	VIIa
15	Irish Sea West	VIIa
16	Porcupine Bank	VIIc,k
17	Aran Islands	VIIb
18	NW and W Ireland	VIIb
19	SW Ireland	VIIg,j
20	NW Labadie, Baltimore and Galley	VIIg,j
21	Jones and Cockburn	VIIg,h,j
22	Smalls	VIIg
23	Bay of Biscay North	VIIIa
24	Bay of Biscay South	VIIIb
25	North Galicia	VIIIc
26	West Galicia	IXa
27	North Portugal (North of Cape Espichel)	IXa
28	SW Portugal (Alentejo)	IXa
29	S Portugal (Algarve)	IXa
30	Gulf of Cadiz	IXa

Table 5.1. - Iceland (Management Unit 1) : catches and landings (in tonnes), effort (in '000 hours trawling), CPUE and LPUE (in kg/hour trawling), of Icelandic Nephrops trawlers, 1980-89

Year	Catches	Landings	Effort	CPUE	LPUE
1980	2 575	2 398	52.7	48.9	45.5
81	2 743	2 520	48.6	56.4	51.8
82	2 889	2 603	50.5	57.2	51.5
83	2 891	2 672	55.9	51.7	47.8
84	2 698	2 459	53.9	50.0	45.6
1985	2 628	2 385	42.3	62.1	56.4
86	2 882	2 564	41.8	68.9	61.3
87	2 980	2 712	51.2	58.2	53.0
88	2 496	2 240	58.0	43.0	38.6
89 (*)	2 123	1 865	53.6	39.6	34.8

(*) provisional

Table 5.2. - Faroes (Management Unit 2) : landings (in tonnes), effort (in '000 creeldays) and LPUE (in g/creelday), 1980-89

Season	Landings	Effort	LPUE
1980/81	54	1 451	37
81/82	50	1 431	35
82/83	81	1 530	53
83/84	93	1 454	64
84/85	50	1 697	30
1985/86	43	784	55
86/87	80	822	97
87/88	91	934	97
88/89	74	960	77
89/90 (*)	53	747	72

(*) provisional

Table 5.3. - Skagerrak (Management Unit 3) : landings (in tonnes), by country, 1980-89

Year	Denmark	Norway	Sweden	Total
1980	643	18	323	984
81	609	8	375	992
82	1 090	8	372	1 470
83	1 589	51	560	2 200
84	1 749	97	830	2 676
1985	1 334	72	785	2 191
86	1 054	64	900	2 018
87	1 385	80	975	2 440
88	1 260	89	1 000	2 349
89 (*)	1 795	70	743	2 608

(*) provisional

Table 5.4. - Skagerrak (Management Unit 3) : catches and landings (in tonnes), effort (in '000 hours trawling), CPUE and LPUE (in kg/hour trawling) of Swedish Nephrops trawlers, 1980-89

Year	Catches	Landings	Effort	CPUE	LPUE
1980	377	301	42.3	8.9	7.1
81	410	328	43.3	9.5	7.6
82	376	300	40.0	9.4	7.5
83	621	497	51.6	12.0	9.6
84	931	745	69.3	13.4	10.8
1985	803	642	66.0	12.2	9.7
86	893	715	74.0	12.1	9.7
87	968	775	91.3	10.6	8.5
88	875	700	108.8	8.1	6.4
89 (*)	772	618	106.3	7.3	5.8

(*) provisional

Table 5.5. - Kattegat (Management Unit 4) : landings (in tonnes), by country, 1980-89

Year	Denmark	Sweden	Total
1980	1 542	122	1 664
81	1 568	160	1 728
82	1 611	217	1 828
83	1 330	142	1 472
84	1 842	194	2 036
1985	1 609	189	1 798
86	1 593	214	1 807
87	1 454	151	1 605
88	1 204	160	1 364
89 (*)	1 222	87	1 309

(*) provisional

Table 5.6. - Kattegat (Management Unit 4) : catches and landings (in tonnes), effort (in '000 hours trawling), CPUE and LPUE (in kg/hour trawling) of Swedish Nephrops trawlers, 1980-89

Year	Catches	Landings	Effort	CPUE	LPUE
1980	94	75	14.1	6.6	5.3
81	143	114	13.9	10.3	8.2
82	222	177	14.3	15.5	12.4
83	109	87	11.7	9.3	7.4
84	159	127	13.7	11.6	9.3
1985	124	99	11.6	10.7	8.5
86	171	137	16.2	10.6	8.5
87	137	109	19.4	7.0	5.6
88	125	100	16.8	7.5	6.0
89 (*)	85	68	19.3	4.4	3.5

(*) provisional

Table 5.7. - Botney Gut - Silver Pit (Management Unit 5) : landings (in tonnes), by country, 1980-89

Year	Belgium	Denmark	UK	Total
1980	565	?	0	≥ 565
81	521	?	0	≥ 521
82	449	?	0	≥ 449
83	628	?	4	≥ 632
84	597	?	1	≥ 598
1985	668	?	< 1	≥ 668
86	375	?	4	≥ 379
87	430	?	5	≥ 435
88	490	59	4	553
89 (*)	556	90	< 1	646

(*) provisional
Belgian landing figures for 1986-88 revised to include tails

Table 5.8. - Botney Gut - Silver Pit (Management Unit 5) : landings (in tonnes), effort (in '000 hours trawling) and LPUE (in kg/hour trawling) of Belgian Nephrops trawlers, 1980-89

Year	Landings	Effort	LPUE
1980	565	46.7	12.1
81	521	44.5	11.7
82	449	39.0	11.5
83	628	38.6	16.3
84	597	53.8	11.1
1985	668	62.0	10.8
86	375	53.8	7.0
87	430	52.9	8.1
88	490	59.4	8.2
89 (*)	556	64.3	8.6

(*) provisional
Belgian landing figures for 1986-88 revised to include tails

Table 5.9. - Farn Deepes (Management Unit 6) : landings (in tonnes), by country, 1980-89

Year	UK	Denmark	Total
1980	1 171	?	≥ 1 171
81	801	?	≥ 801
82	1 406	?	≥ 1 406
83	2 280	?	≥ 2 280
84	1 919	?	≥ 1 919
1985	1 578	?	≥ 1 578
86	2 179	?	≥ 2 179
87	2 154	?	≥ 2 154
88	2 159	10	2 169
89 (*)	2 632	1	2 633

(*) provisional

Figures for UK are for years ending June 30th

Table 5.10. - Farn Deepes (Management Unit 4) : catches and landings (in tonnes), effort (in '000 hours trawling), CPUE and LPUE (in kg/hour trawling) of UK Nephrops trawlers, 1980-89

Season	Catches	Landings	Effort	CPUE	LPUE
1979/80	?	1 171	58	?	20
80/81	?	801	45	?	17
81/82	?	1 406	51	?	26
82/83	?	2 280	73	?	30
83/84	?	1 919	75	?	26
1984/85	3 068	1 578	63	49	25
85/86	4 127	2 179	95	43	23
86/87	3 040	2 154	93	33	23
87/88	4 767	2 159	109	44	19
88/89 (*)	4 895	2 632	116	43	22

(*) provisional

Figures for catches and CPUE differ from those in the last Working Group report, due to revised estimates of discards

Table 5.11. - Fladen (Management Unit 7) : landings (in tonnes), by country, 1980-89

Year	UK	Denmark	Total
1980	617	?	≥ 617
81	373	?	≥ 373
82	422	?	≥ 422
83	693	?	≥ 693
84	646	?	≥ 646
1985	1 141	7	1 148
86	1 439	50	1 489
87	1 373	323	1 696
88	1 493	81	1 574
89 (*)	2 133	230	2 363

(*) provisional

Table 5.12. - Fladen (Management Unit 7) : landings (in tonnes), effort (in '000 hours trawling) and LPUE (in kg/hour trawling) of Scottish Nephrops trawlers, 1980-89

Year	Landings	Effort	LPUE
1980	498	19.4	25.7
81	304	8.6	35.3
82	382	12.2	31.3
83	548	15.4	35.5
84	549	11.4	48.2
1985	1 016	26.6	38.2
86	1 398	37.8	37.0
87	1 024	41.6	24.6
88	1 306	41.7	31.3
89 (*)	1 719	47.1	36.5

(*) provisional

Table 5.13. - Danish Nephrops landings from the North Sea, by area, 1985-89

Year	Silver Pit	Farn Deeps	Fladen Ground	Norwegian Deep	Other areas
1985	?	?	?	?	?
86	?	?	50	?	?
87	?	?	323	?	?
88	59	10	81	54	59
89 (*)	90	1	230	56	125

(*) provisional

Table 5.14. - Nephrops landings by UK vessels in Scotland : by type of fishing gear, all management units combined, 1985-89

Year	Nephrops trawl	Light trawl	Other trawl	Creel	Total all gears
1985	15 237	1 217	52	1 307	17 813
86	14 709	1 056	16	1 155	16 936
87	13 211	1 400	26	1 193	15 830
88	16 747	1 308	27	1 097	19 179
89 (*)	15 134	1 677	60	1 144	18 015

(*) provisional

Table 5.15. - Nephrops landings by UK vessels in Scotland, by management unit, all gears combined, 1980-89

Year	Fladen	Firth of Forth	Moray Firth	Noup	Other areas	Total North Sea	North Minch	South Minch	Clyde	Other areas	Total W Scotl.
1980	617	1 159	992	90	15	2 873	2 250	2 583	2 399	191	7 422
81	373	1 006	1 416	36	77	2 907	2 861	3 457	2 968	233	9 519
82	422	1 195	1 120	19	158	2 914	2 799	3 274	2 623	305	9 000
83	693	1 724	940	15	99	3 472	3 196	3 252	4 064	194	10 706
84	646	2 134	1 170	111	89	4 150	4 144	3 939	3 299	395	11 777
1985	1 141	1 969	2 081	22	43	5 256	4 061	3 827	4 279	282	12 449
86	1 493	2 263	2 143	68	194	6 161	3 382	3 317	4 329	255	11 283
87	1 373	1 674	1 991	44	188	5 270	4 084	3 707	3 004	430	11 225
88	1 493	2 528	1 959	76	363	6 419	4 035	4 310	3 655	638	12 638
89	2 133	1 884	2 576	84	221	6 898	3 205	4 415	2 797	533	10 950

Table 5.16. - Firth of Forth (Management Unit 8) : landings (in tonnes), effort (in '000 hours trawling) and LPUE (in kg/hour trawling) of Scottish Nephrops trawlers, 1980-89

Year	Landings	Effort	LPUE
1980	1 063	50.8	20.9
81	945	42.6	22.2
82	1 138	51.7	22.0
83	1 681	60.7	27.7
84	2 078	84.7	24.5
1985	1 908	73.9	25.8
86	2 204	74.7	29.5
87	1 582	62.1	25.5
88	2 455	94.8	25.9
89 (*)	1 833	78.7	23.3

(*) provisional

Table 5.17. - Moray Firth (Management Unit 9) : landings (in tonnes), effort (in '000 hours trawling) and LPUE (in kg/hour trawling) of Scottish Nephrops trawlers, 1980-89

Year	Landings	Effort	LPUE
1980	820	29.9	27.4
81	1 298	36.7	35.4
82	1 034	28.2	36.7
83	850	21.4	39.7
84	960	23.2	41.4
1985	1 908	49.2	38.8
86	1 933	51.6	37.5
87	1 723	70.6	24.4
88	1 638	60.9	26.9
89 (*)	2 102	69.6	30.2

(*) provisional

Revised data, based on a new description of the Moray Firth area, including an extra statistical rectangle

Table 5.18. - Noup (Management Unit 10) : landings (in tonnes), effort (in '000 hours trawling) and LPUE (in kg/hour trawling) of Scottish Nephrops trawlers, 1980-89

Year	Landings	Effort	LPUE
1980	36.5	1.0	35.4
81	12.7	0.4	34.3
82	11.6	0.5	24.7
83	9.2	0.3	30.7
84	75.3	2.0	36.9
1985	1.5	< 0.1	25.0
86	45.7	0.7	62.6
87	12.3	0.7	18.1
88	23.3	1.0	34.3
89 (*)	23.7	0.9	25.8

(*) provisional

Table 5.19. - North Minch (Management Unit 11) : landings (in tonnes), effort (in '000 hours trawling) and LPUE (in kg/hour trawling) of Scottish Nephrops trawlers, 1980-89

Year	Landings	Effort	LPUE
1980	1 727	70.3	24.6
81	2 320	78.7	29.5
82	2 323	82.5	28.2
83	2 784	64.5	43.2
84	3 616	87.7	41.2
1985	3 371	107.8	31.3
86	2 642	93.0	28.4
87	3 458	121.2	28.5
88	3 449	115.0	30.0
89 (*)	2 603	87.9	29.6

(*) provisional

Table 5.20. - South Minch (Management Unit 12) : landings (in tonnes), effort (in '000 hours trawling) and LPUE (in kg/hour trawling) of Scottish Nephrops trawlers, 1980-89

Year	Landings	Effort	LPUE
1980	1 561	75.7	20.6
81	2 823	100.5	28.1
82	2 690	98.9	27.2
83	2 500	75.4	33.2
84	3 719	130.7	28.5
1985	3 547	173.8	20.4
86	2 599	102.3	25.4
87	2 880	124.2	23.2
88	3 465	118.4	29.3
89	3 665	132.2	27.7

(*) provisional

Table 5.21. - Clyde (Management Unit 13) : landings (in tonnes), effort (in '000 hours trawling) and LPUE (in kg/hour trawling) of Scottish Nephrops trawlers, 1980-89

Year	Landings	Effort	LPUE
1980	2 184	112.3	19.5
81	2 498	132.7	18.8
82	2 373	113.2	21.0
83	3 889	149.9	25.9
84	3 223	161.9	19.9
1985	4 185	185.8	22.5
86	4 189	168.4	24.9
87	2 859	144.3	19.8
88	3 505	150.7	23.3
89 (*)	2 577	150.0	17.2

(*) provisional

Table 5.22. - Irish Sea East (Management Unit 14) : landings
(in tonnes), by country, 1980-89

Year	UK	France	Total
1980	730	153	883
81	829	254	1 083
82	869	87	956
83	763	27	790
84	602	41	643
1985	498	42	540
86	664	93	757
87	444	55	499
88	462	62	524
89 (*)	393	19	412

(*) provisional

Table 5.23. - Irish Sea East (Management Unit 14) : effort
(in '000 hours trawling) and LPUE (in kg/hour
trawling) of Nephrops directed voyages by UK
trawlers, 1980-89

Year	Effort	LPUE
1980	22.0	29
81	18.5	37
82	26.8	29
83	24.1	28
84	21.9	24
1985	14.7	29
86	19.6	29
87	22.4	15
88	18.9	19
89 (*)	18.2	17

(*) provisional

Table 5.24. - Irish Sea West (Management Unit 15) : landings
(in tonnes), by country, 1980-89

Year	Northern Ireland	Rep. of Ireland	Isle of Man	England & Wales	Total
1980	2 544	1 565	267	1	4 377
81	3 748	3 038	273	2	7 061
82	4 487	4 235	363	0	9 085
83	4 950	3 747	170	1	8 868
84	4 030	2 704	169	< 1	6 904
1985	4 320	1 991	3	25	6 339
86	5 204	3 404	7	30	8 645
87	5 012	4 141	18	28	9 199
88	5 252	2 870	39	50	8 211
89 (*)	5 553	2 458	2	22	8 035

(*) provisional

Republic of Ireland figures revised with whole weight/tail weight ratio = 3.0, instead of 3.5 as given in last year's Working Group report

Table 5.25. - Irish Sea West (Management Unit 15) : catches and landings (in tonnes), effort index (based on Hp and hours fished) and LPUE of Northern Ireland Nephrops trawlers, 1980-89

Year	Catches	Landings	Effort	CPUE	LPUE
1980	4 088	2 544	?	?	?
81	5 850	3 748	38.2	?	0.10
82	6 727	4 487	32.1	?	0.14
83	6 410	4 950	?	?	?
84	5 191	4 030	28.0	?	0.14
1985	5 409	4 320	34.8	?	0.12
86	6 282	5 204	35.2	?	0.15
87	5 739	5 012	40.7	?	0.12
88	5 669	5 252	42.4	?	0.12
89 (*)	6 232	5 553	?	?	?

(*) provisional

Table 5.26. - Porcupine Bank (Management Unit 16) and Aran Islands (Management Unit 17) : landings (in tonnes), by country, 1980-89

Year	Porcupine Bank				Aran	PB+Aran
	France	Spain	UK (a)	UK (b)	France	Ireland
1980	21	2 904	?	?	452	308
81	66	3 315	?	?	442	70
82	358	3 931	?	55	414	512
83	615	2 811	?	4	210	795
84	1 067	2 504	?	1	131	267
1985	1 181	2 738	88	0	324	1 665
86	1 060	1 462	102	< 1	207	838
87	609	1 677	261	4	147	1 030
88	600	1 555	297	2	62	691
89 (*)	324	1 417	62	5	14	1 167

(*) provisional

(a) English vessels, landed in Spain

(b) English vessels, landed in UK

Table 5.27. - Porcupine Bank (Management Unit 16) : total effort (all gears combined) and CPUE (in kg per fishing day, per BHP * 100⁻²) for different gears and for all gears combined, of the Spanish fleet, 1980-89

Year	Total effort	Nephrops trawl	Finfish trawl	Total CPUE
1980	162 620	?	?	17.8
81	142 901	?	?	23.2
82	137 883	118.5	20.7	28.5
83	107 643	97.7	18.5	26.1
84	113 535	94.7	16.6	22.1
1985	115 331	74.6	18.5	23.7
86	95 269	61.8	10.9	15.4
87	104 530	60.8	12.7	16.0
88	108 856	43.8	10.8	14.3
89 (*)	104 825	45.1	10.8	13.5

(*) provisional

Table 5.28. - Porcupine Bank (Management Unit 16) : effort (in days fishing) and LPUE (in kg/day) of French Nephrops trawlers, home port Saint Guénolé, 1980-89

Year	Effort	LPUE
1980	?	?
81	?	?
82	?	950
83	359	849
84	748	760
1985	783	752
86	591	802
87	511	493
88	329	512
89 (*)	314	331

(*) provisional

Table 5.29. - Republic of Ireland coast (Management Units 18 and 19) : landings (in tonnes) by the Republic of Ireland, 1980-89

Year	MU 18	MU 19
1980	1	489
81	21	417
82	2	307
83	4	488
84	90	408
1985	22	673
86	8	474
87	9	725
88	13	601
89 (*)	?	?

(*) data for 1989 not yet available

Table 5.30. - Celtic Sea (Management Units 20, 21 and 22) : landings (in tonnes), by country, 1980-89

Year	France MU 20-22	Ireland MU 22	Total
1980	3 498	30	3 528
81	3 680	58	3 738
82	2 917	87	3 004
83	3 667	510	4 177
84	3 653	253	3 906
1985	3 599	222	3 821
86	2 638	167	2 805
87	3 041	329	3 370
88	2 825	239	3 064
89 (*)	3 185	540	3 725

(*) provisional

Table 5.31. - Celtic Sea (Management Units 20, 21 and 22) : effort (in days fishing) and LPUE (in kg/day) of French Nephrops trawlers, home port Saint Guénolé, 1980-89

Year	Effort	LPUE
1980	?	?
81	?	246
82	?	218
83	5 743	242
84	4 169	268
1985	4 106	282
86	4 205	233
87	4 656	263
88	4 595	256
89 (*)	4 183	272

(*) provisional

Table 5.32. - Bay of Biscay (Management Units 23 and 24) : landings (in tonnes) by the French fleet, 1980-89

Year	North MU 23	South MU 24	Total
1980	6 036	71	6 107
81	5 908	182	6 090
82	4 392	298	4 690
83	5 566	342	5 908
84	4 485	198	4 683
1985	4 281	312	4 593
86	3 968	367	4 335
87	5 074	482	5 556
88	6 019	201	6 220
89 (*)	4 600	599	5 199

(*) provisional

Table 5.33. - Bay of Biscay North (Management Unit 23) : effort (in days fishing) and LPUE (in kg/day) of French Nephrops trawlers, home port Lesconil, 1980-89

Year	Effort	LPUE
1980	7 751	109
81	6 942	112
82	6 709	102
83	6 481	109
84	5 673	87
1985	5 603	88
86	5 137	95
87	5 673	106
88	5 433	119
89 (*)	5 362	95

(*) provisional

Table 5.34. - North Galicia (Management Unit 25) and Cantabrian Sea : landings (in tonnes) by the Spanish fleet, 1980-89

Year	North Galicia	Cantabrian Sea
1980	559	?
81	318	?
82	431	?
83	418	63
84	487	100
1985	439	128
86	313	127
87	361	118
88	372	151
89 (*)	298	139

(*) provisional

Table 5.35. - North Galicia (Management Unit 25) : effort (in days fishing) and CPUE (in kg per day, per BHP * 100⁻²) of Spanish "bacas", 1980-89

Year	Effort	CPUE
1980	6 942	14.4
81	7 147	8.5
82	7 698	10.1
83	6 343	12.2
84	6 260	14.7
1985	6 015	14.1
86	5 017	11.4
87	4 266	15.4
88	5 246	13.2
89 (*)	5 753	10.1

(*) provisional

Table 5.36. - West Galicia (Management Unit 26) and Gulf of Cadiz (Management Unit 30) : landings (in tonnes) by the Spanish fleet, 1980-89

Year	West Galicia	Gulf of Cadiz
1980	599	?
81	823	?
82	736	?
83	786	?
84	604	?
1985	750	257
86	657	221
87	671	302
88	640	?
89 (*)	626	?

(*) provisional

Table 5.37. - West Galicia (Management Unit 26) : CPUE data (in kg/trip) of Spanish Nephrops trawlers, home ports Muros and Riveira, 1980-89

Year	Muros	Riveira
1980	?	?
81	?	?
82	?	?
83	?	?
84	21.3	20.2
1985	33.5	30.7
86	23.9	28.0
87	20.3	25.3
88	15.4	22.0
89 (*)	16.4	27.4

(*) provisional

Table 5.38. - N Portugal (Management Unit 27), SW and S Portugal (Management Units 28 and 29) : landings (in tonnes), by country, 1980-89

Year	N Portugal	SW and S Portugal	
	Portugal	Spain	Portugal
1980	40	1 453	147
81	35	1 303	128
82	13	1 307	86
83	18	0	244 (3)
84	13	0	437 (37)
1985	13	0	495 (39)
86	36	0	821 (41)
87 (*)	97	0	1 482 (45)
88 (*)	45	0	1 026 (42)
89 (*)	25	0	350 (32)

(*) provisional

(nn) no. of Portuguese trawlers given in brackets

Table 6.1. - Iceland (Management Unit 1) : mean sizes (CL in mm) of male and female Nephrops in catches, 1980-89

Year	Males	Females
1980	44.6	34.5
81	45.2	35.1
82	44.8	34.8
83	46.3	34.1
84	46.0	35.0
1985	45.7	35.4
86	44.9	35.6
87	46.6	37.2
88	46.0	36.5
89	45.1	35.7

Table 6.2. - Farn Deepes (Management Unit 6) : mean sizes (CL in mm) of male and female Nephrops in English catches and landings, 1980-89

Season	Catch		Landings	
	Males	Females	Males	Females
1979/80	?	?	?	?
80/81	?	?	36.3	34.6
81/82	?	?	37.2	35.8
82/83	?	?	36.9	34.7
83/84	?	?	36.5	33.9
1984/85	29.6	27.1	35.6	33.9
85/86	30.1	28.7	35.2	33.7
86/87	30.5	29.6	34.7	33.2
87/88	28.1	26.1	35.0	32.4
88/89	28.1	26.8	32.7	32.1

Table 6.3. - Fladen (Management Unit 7) : mean sizes (CL in mm) of male and female Nephrops in Scottish landings, 1980-89

Year	Males	Females
1980	32.0	29.2
81	35.3	31.1
82	39.5	32.7
83	36.2	30.9
84	30.2	28.6
1985	35.2	31.6
86	31.3	28.7
87	31.5	29.5
88	30.0	29.4
89	33.6	31.5

Table 6.4. - Firth of Forth (Management Unit 8) : mean sizes of male and female Nephrops (CL in mm) in Scottish landings, 1980-89

Year	Males	Females
1980	?	?
81	35.1	33.9
82	34.4	33.4
83	34.5	32.9
84	34.2	31.4
1985	33.3	31.0
86	31.8	30.4
87	32.3	31.2
88	30.1	29.4
89	30.4	30.4

Table 6.5. - Moray Firth (Management Unit 9) : mean sizes (CL in mm) of male and female Nephrops in Scottish landings, 1980-89

Year	Males	Females
1980	33.4	31.0
81	35.4	31.2
82	34.4	30.3
83	33.8	31.3
84	32.3	31.0
1985	31.0	29.8
86	30.9	28.9
87	30.9	29.6
88	31.2	30.8
89	30.2	29.2

Table 6.6. - North Minch (Management Unit 11) : mean sizes (CL in mm) of male and female Nephrops in Scottish landings, 1980-89

Year	Males	Females
1980	34.0	30.2
81	33.4	31.1
82	35.0	30.6
83	32.6	29.2
84	32.6	29.1
1985	33.8	29.2
86	32.5	32.5
87	32.8	31.4
88	32.6	31.4
89	30.1	30.1

Table 6.7. - South Minch (Management Unit 12) : mean sizes (CL in mm) of male and female Nephrops in Scottish landings, 1980-89

Year	Males	Females
1980	33.8	34.2
81	35.4	31.6
82	32.0	29.8
83	32.9	30.0
84	31.6	26.9
1985	32.7	28.8
86	33.5	28.3
87	32.2	29.7
88	31.4	30.0
89	32.0	30.0

Table 6.8. - Clyde (Management Unit 13) : mean sizes (CL in mm) of male and female Nephrops in Scottish landings, 1980-89

Year	Males	Females
1980	36.1	34.2
81	33.3	31.6
82	31.2	29.8
83	31.9	30.0
84	29.2	26.9
1985	30.5	28.8
86	30.6	28.3
87	31.3	29.7
88	33.7	30.7
89	35.4	33.1

Table 6.9. - Irish Sea East (Management Unit 14) : mean sizes (CL in mm) of male and female Nephrops in Northern Ireland and English landings, 1985-89

Year	Males	Females
1985	32.0	29.3
86	32.2	29.5
87	35.9	32.5
88	37.9	36.4
89 (*)	?	?

(*) data for 1989 not available, due to insufficient sampling

Table 6.10. - Irish Sea West (Management Unit 15) : mean sizes (CL in mm) of male and female Nephrops in Northern Ireland catches, 1980-89

Year	Males	Females
1980	26.0	23.9
81	25.5	23.1
82	24.4	22.1
83	24.5	22.2
84	26.2	23.2
1985	25.9	23.0
86	26.5	23.6
87	26.8	23.9
88	27.5	24.5
89	26.4	23.8

Table 6.11. - Irish Sea West (Management Unit 15) : mean weight (in grams) of Nephrops in Republic of Ireland catches, landings and discards, 1971 and 1984-89

Year	Catch	Landings	Discards
1971	12.6	16.6	8.4
....
1984	10.9	16.2	7.6
1985	10.5	14.9	7.7
1986	11.0	14.4	7.5
1987	11.4	14.9	7.2
1988	12.3	14.8	8.0
1989	11.5	13.3	8.1

Table 6.12. - Porcupine Bank (Management Unit 16) : mean sizes (CL in mm) of male and female Nephrops in Spanish catches, 1980-89

Year	Males	Females
1980	37.9	33.1
81	39.9	34.5
82	40.9	34.8
83	40.8	34.0
84	39.7	33.1
1985	38.7	33.5
86	40.8	34.9
87	39.5	35.1
88	40.7	38.4
89	40.5	36.8

Table 6.13. - Celtic Sea (Management Units 20, 21 and 22) : mean sizes (CL in mm) of male and female Nephrops in French landings, 1980-89

Year	Males	Females
1980	?	?
81	?	?
82	?	?
83	?	?
84	39.0	36.3
1985	39.2	36.9
86	39.3	37.5
87	38.8	35.1
88	35.7	34.7
89	38.9	36.0

Table 6.14. - Bay of Biscay (Management Units 23 and 24) : mean sizes (CL in mm) of male and female Nephrops in French landings, 1980-89

Year	Males	Females
1980	?	?
81	?	?
82	?	?
83	?	?
84	26.9	27.0
1985	26.1	26.7
86	27.3	27.7
87	28.8	26.3
88	28.5	26.2
89	29.2	26.8

Table 6.15. - North Galicia (Management Unit 25) : mean sizes (CL in mm) of male and female Nephrops in Spanish catches, 1980-89

Year	Males	Females
1980	36.3	34.1
81	37.8	36.3
82	36.9	35.2
83	34.7	32.2
84	35.2	32.0
1985	35.8	33.1
86	35.1	32.1
87	37.2	35.6
88	37.9	36.0
89	40.9	38.7

Table 6.16. - West Galicia (Management Unit 26) : mean sizes (CL in mm) of male and female Nephrops in Spanish catches, 1980-89

Year	Males	Females
1980	?	?
81	36.9	37.8
82	39.0	38.3
83	35.8	33.1
84	?	?
1985	34.3	31.3
86	36.6	31.9
87	?	?
88	35.0	32.9
89	29.9	28.5

Table 6.17. - S and SW Portugal (Managem. Units 28 and 29) : mean sizes (CL in mm) of male and female Nephrops in Portuguese landings and research cruise samples, 1980-89

Year	Landings		Research cruises	
	Males	Females	Males	Females
1980	?	?	?	?
81	?	?	?	?
82	?	?	?	?
83	36	32	36	32
84	34	30	36	32
1985	37	34	36	30
86	37	33	36	32
87	34	31	34	31
88	35	32	?	?
89	37	33	?	?

Table 7.1a. - Input parameters for the Y/R assessments - Management Units in ICES Sub-areas III and V

Management Unit(s)	Sex	Option	Reference period	Group int.val	+Grp	K	L ∞	Term. F	M	Discard surv.	Mesh size	SF	SR
1 Iceland	σ only		1988-89	2	70	0.11	80	0.3	0.2	..	80	0.50	12
2 Faroe Islands	σ		1989-90	2	77	0.11	80	0.3	0.2	..	Creel fishery		
	ϱ		1989-90	1	58	0.13	55	0.3	0.2	..			
3 Skagerrak					No Y/R or mesh assessment made								
4 Kattegat					No Y/R or mesh assessment made								

Group interval, + Group, L ∞ , Mesh size and Selection range in mm

Table 7.1b. - Input parameters for the Y/R assessments - Management Units in ICES Sub-area IV

Management Unit(s)	Sex	Option	Reference period	Group int.val	+Grp	K	L [∞]	Term. F	M	Discard surv.	Mesh size	SF	SR
5 Botney Gut	♂		1986-89	2	60	0.165	62	0.3	0.3	0.25	70	0.4	13
	♀		1986-89	2	58	0.08	60	0.3	0.2	0.25	70	0.4	13
6 Farn Deepes	♂		1984-89	2	66	0.18	70	0.3	0.3	0.25	70	0.4	13
	♀ immat		1984-89	2	..	0.18	70	0.1	0.3	0.25	70	0.4	13
	♀ mat		1984-89	2	58	0.06	62	0.1	0.2	0.25	70	0.4	13
7 Fladen	♂		1980-89	2	63	0.16	65	0.3	0.3	..	70	0.48	14
	♀ immat		1980-89	2	..	0.16	65	0.3	0.3	..	70	0.48	14
	♀ mat		1980-89	2	53	0.10	56	0.3	0.2	..	70	0.48	14
8 Firth of Forth	♂		1980-89	2	65	0.163	66	0.3	0.3	0.25	70	0.4	13
	♀ immat		1980-89	2	..	0.163	66	0.3	0.3	0.25	70	0.4	13
	♀ mat		1980-89	2	57	0.065	58	0.3	0.2	0.25	70	0.4	13
9 Moray Firth	♂	(a)	1980-89	2	61	0.165	62	0.3	0.3	0.25	70	0.4	13
	♂	(b)	1980-89	2	61	0.16	62	0.3	0.2	0.25	70	0.4	13
	♀ immat	(c)	1980-89	2	..	0.165	62	0.3	0.3	0.25	70	0.4	13
	♀ mat	(c)	1980-89	2	55	0.06	56	0.3	0.2	0.25	70	0.4	13
	♀ immat	(d)	1980-89	2	..	0.165	62	0.3	0.3	0.25	70	0.4	13
	♀ mat	(d)	1980-89	2	55	0.10	56	0.3	0.2	0.25	70	0.4	13
	♀ immat	(e)	1980-89	2	..	0.165	62	0.3	0.2	0.25	70	0.4	13
	♀ mat	(e)	1980-89	2	55	0.06	56	0.3	0.1	0.25	70	0.4	13
10 Noup													
No Y/R or mesh assessment made													

Group interval, + Group, L[∞], Mesh size and Selection range in mm

Table 7.1c. - Input parameters for the Y/R assessments - Management Units in ICES Sub-area VI and Division VIIa

Management Unit(s)	Sex	Option	Reference period	Group int.val	+Grp	K	L ∞	Term. F	M	Discard surv.	Mesh size	SF	SR
11 North Minch	σ		1980-89	2	65	0.163	66	0.3	0.3	0.25	70	0.4	13
	φ immat		1980-89	2	..	0.163	66	0.3	0.3	0.25	70	0.4	13
	φ mat		1980-89	2	57	0.06	58	0.3	0.2	0.25	70	0.4	13
12 South Minch	σ		1980-89	2	67	0.161	68	0.3	0.3	0.25	70	0.4	13
	φ immat		1980-89	2	..	0.161	68	0.3	0.3	0.25	70	0.4	13
	φ mat		1980-89	2	57	0.06	59	0.3	0.2	0.25	70	0.4	13
13 Clyde	σ		1980-89	2	67	0.16	73	0.3	0.3	0.25	70	0.4	13
	φ immat		1980-89	2	..	0.16	73	0.3	0.3	0.25	70	0.4	13
	φ mat		1980-89	2	59	0.06	62	0.3	0.2	0.25	70	0.4	13
14 Irish Sea East	σ		1985-88	2	52	0.16	60	0.5	0.3	0.25	70	0.4	10
	φ immat		1985-88	2	..	0.16	60	0.5	0.3	0.25	70	0.4	10
	φ mat		1985-88	2	48	0.10	56	0.5	0.2	0.25	70	0.4	10
15 Irish Sea West	σ	(a)	1987-89	2	56	0.16	60	0.3	0.2	0.10	68	0.4	10
	σ	(b)	1987-89	2	56	0.16	60	0.3	0.25	0.10	68	0.4	10
	σ	(c)	1987-89	2	56	0.16	60	0.3	0.3	0.10	68	0.4	10
	φ immat		1987-89	2	..	0.16	60	0.3	0.2	0.10	68	0.4	10
	φ mat		1987-89	2	54	0.10	56	0.3	0.2	0.10	68	0.4	10

Group interval, + Group, L ∞ , Mesh size and Selection range in mm

Table 7.1d. - Input parameters for the Y/R assessments - Management Units in ICES Sub-areas VII (except VIIa), VIII and IX

Management Unit(s)	Sex	Option	Reference period	Group int.val	+Grp	K	L _∞	Term. F	M	Discard surv.	Mesh size	SF	SR
16 Porcupine Bank	♂		1980-89	2	68	0.14	75	0.4	0.2	..	74	0.58	25
	♀		1980-89	2	50	0.16	60	0.3	0.2	..	74	0.58	25
17 Aran Islands				No Y/R or mesh assessment made									
18+19 Irish coast				No Y/R or mesh assessment made									
20+21+22 Celtic Sea	♂		1987-89	2	66	0.12	68	0.2	0.3	0.20	80	0.5	17.2
	♀		1987-89	2	48	0.17	49	0.2	0.3	0.20	80	0.5	17.2
23+24 Bay of Biscay	♂		1987-89	2	64	0.11	76	0.5	0.3	0.30	50	0.5	11
	♀		1987-89	2	54	0.14	56	0.4	0.3	0.30	50	0.5	11
25 North Galicia	♂		1984-89	2	70	0.12	80	0.4	0.2	..	40	0.49	9.7
	♀		1984-89	2	60	0.15	65	0.4	0.2	..	40	0.49	9.7
26 West Galicia	♂		1981-89	5	80	0.12	85	0.4	0.2	..	40	0.49	9.7
	♀		1981-89	5	65	0.15	70	0.4	0.2	..	40	0.49	9.7
27 N Portugal				No Y/R or mesh assessment made									
28+29 SW and S Portugal	♂		1984-89	2	66	0.20	70	0.5	0.2	..	50	0.46	11.5
	♀ immat		1984-89	2	..	0.20	70	0.5	0.2	..	50	0.46	11.5
	♀ mat		1984-89	2	62	0.068	65	0.5	0.1	..	50	0.46	11.5
30 Gulf of Cadiz				No Y/R or mesh assessment made									

Group interval, + Group, L_∞, Mesh size and Selection range in mm

Table 7.2. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 1 - Iceland
 Icelandic length data

Sex : Males

Length	Removed	Delta T	F
20	6	.3082	.0002
22	28	.3190	.0009
24	100	.3306	.0034
26	231	.3431	.0082
28	554	.3566	.0204
30	943	.3711	.0362
32	1 562	.3869	.0632
34	1 687	.4041	.0727
36	2 172	.4229	.1007
38	1 841	.4435	.0925
40	2 652	.4663	.1466
42	3 077	.4915	.1927
44	2 615	.5196	.1887
46	2 942	.5511	.2506
48	2 748	.5867	.2871
50	2 337	.6272	.3090
52	2 164	.6737	.3794
54	1 599	.7277	.3909
56	1 206	.7910	.4310
58	826	.8665	.4594
60	406	.9578	.3552
62	353	1.0708	.5277
64	143	1.2139	.4026
66	95	1.4014	.5602
68	39	1.6575	.6593
70	10		.3000

Table 7.3a. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards
(where available) in numbers (in '000),
- * delta T, i.e. the time taken to grow from
one length to the next, and
- * annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 2 - Faroe Islands
Faroe length data

Sex : Males

Length	Removed	Delta T	F
39	3	.4546	.0060
41	9	.4786	.0179
43	44	.5052	.0891
45	77	.5349	.1773
47	82	.5684	.2214
49	63	.6063	.2041
51	36	.6496	.1358
53	33	.6996	.1439
55	28	.7580	.1447
57	15	.8270	.0956
59	18	.9098	.1304
61	11	1.0111	.0940
63	7	1.1378	.0777
65	4	1.3009	.0579
67	4	1.5187	.0626
69	2	1.8243	.0455
71	2	2.2847	.0612
73	1	3.0588	.0448
75	1	4.6439	.0372
77	1		.3000

Table 7.3b. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)

Management Unit : 2 - Faroe Islands Sex : Females
Faroe length data

Length	Removed	Delta T	F
35	1	.3017	.0023
36	1	.3140	.0047
37	1	.3274	.0024
38	6	.3419	.0270
39	9	.3578	.0407
40	22	.3753	.1073
41	39	.3946	.2048
42	41	.4159	.2474
43	62	.4397	.4455
44	41	.4663	.3668
45	33	.4965	.3616
46	20	.5307	.2719
47	17	.5701	.2753
48	9	.6157	.1688
49	8	.6693	.1855
50	8	.7332	.2251
51	5	.8105	.1656
52	2	.9060	.0870
53	2	1.0272	.1021
54	3	1.1858	.1596
55	2	1.4025	.1734
56	2	1.7165	.1929
57	1	2.2129	.0974
58	1		.3000

Table 7.4a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 5 - Botney Gut
Belgian length data

Sex : Males

Length	Removed	Delta T	F
24	43	.3277	.0042
26	229	.3464	.0238
28	764	.3674	.0850
30	1 363	.3911	.1675
32	1 274	.4181	.1773
34	956	.4491	.1514
36	1 018	.4851	.1858
38	1 045	.5273	.2268
40	955	.5776	.2552
42	787	.6385	.2677
44	556	.7138	.2464
46	410	.8093	.2425
48	306	.9342	.2526
50	199	1.1050	.2425
52	108	1.3524	.2040
54	61	1.7435	.1928
56	29	2.4574	.1795
58	8	4.2009	.1277
60	3		.3000

Table 7.4b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 5 - Botney Gut
 Belgian length data

Sex : Females

Length	Removed	Delta T	F
24	78	.7145	.0043
26	216	.7578	.0131
28	626	.8067	.0427
30	1 145	.8624	.0914
32	1 023	.9263	.0990
34	689	1.0005	.0817
36	668	1.0876	.0986
38	656	1.1914	.1262
40	412	1.3170	.1066
42	254	1.4723	.0891
44	120	1.6691	.0569
46	67	1.9269	.0431
48	51	2.2790	.0464
50	21	2.7893	.0285
52	15	3.5960	.0329
54	7	5.0683	.0297
56	3	8.6643	.0370
58	2		.3000

Table 7.5a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 6 - Farn Deepes
English length data

Sex : Males

Length	Removed	Delta T	F
14	42	.2020	.0010
16	225	.2097	.0055
18	1 513	.2179	.0383
20	4 754	.2268	.1259
22	10 339	.2364	.2956
24	14 063	.2470	.4531
26	16 065	.2584	.6102
28	15 967	.2711	.7493
30	12 152	.2850	.7235
32	10 081	.3004	.7737
34	7 953	.3175	.8085
36	6 058	.3368	.8382
38	4 112	.3585	.7866
40	2 701	.3833	.7131
42	1 941	.4117	.7135
44	1 219	.4447	.6286
46	866	.4834	.6322
48	550	.5295	.5795
50	334	.5853	.5094
52	223	.6544	.5006
54	130	.7418	.4402
56	96	.8564	.5255
58	46	1.0129	.4414
60	24	1.2397	.4289
62	12	1.5982	.4820
64	3	2.2526	.3230
66	1		.3000

Table 7.5b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 6 - Farn Deepes
 English length data

Sex : Females

Length	Removed	Delta T	F
14	126	.2020	.0028
16	502	.2097	.0116
18	2 105	.2179	.0504
20	5 420	.2268	.1360
22	9 945	.2364	.2689
24	14 206	.2470	.4248
26	13 137	.9526	.1286
28	10 168	1.0104	.1296
30	8 335	1.0756	.1417
32	7 557	1.1499	.1795
34	4 668	1.2351	.1604
36	3 625	1.3340	.1862
38	1 821	1.4502	.1428
40	1 075	1.5885	.1281
42	628	1.7560	.1159
44	372	1.9631	.1098
46	184	2.2255	.0897
48	68	2.5692	.0551
50	29	3.0387	.0397
52	13	3.7191	.0322
54	3	4.7947	.0149
56	1	6.7578	.0120
58	2		.1000

Table 7.6a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 7 - Fladen
 Scottish length data

Sex : Males

Length	Removed	Delta T	F
17	3	.2660	.0002
19	79	.2778	.0053
21	368	.2908	.0256
23	1 002	.3049	.0737
25	1 845	.3206	.1467
27	2 587	.3379	.2292
29	3 295	.3572	.3381
31	3 349	.3789	.4154
33	2 652	.4034	.4081
35	2 253	.4312	.4383
37	1 916	.4632	.4876
39	1 427	.5003	.4914
41	966	.5438	.4581
43	568	.5957	.3690
45	336	.6585	.2930
47	216	.7361	.2507
49	165	.8346	.2609
51	110	.9634	.2472
53	64	1.1395	.2113
55	41	1.3946	.2097
57	8	1.7980	.0630
59	8	2.5342	.1003
61	2	4.3322	.0493
63	2		.3000

Table 7.6b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 7 - Fladen
 Scottish length data

Sex : Females

Length	Removed	Delta T	F
17	9	.2660	.0011
19	61	.2778	.0076
21	408	.2908	.0516
23	1 204	.3049	.1591
25	2 044	.6669	.1462
27	2 709	.7146	.2368
29	2 564	.7696	.2935
31	1 821	.8338	.2845
33	1 366	.9097	.3000
35	849	1.0008	.2689
37	557	1.1123	.2586
39	356	1.2516	.2507
41	170	1.4310	.1827
43	88	1.6705	.1415
45	43	2.0067	.1037
47	18	2.5131	.0654
49	19	3.3647	.1197
51	5	5.1083	.0685
53	4		.3000

Table 7.7a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 8 - Firth of Forth Sex : Males
 Scottish length data

Length	Removed	Delta T	F
17	3 010	.2567	.0872
19	3 355	.2668	.1032
21	6 642	.2789	.2218
23	6 884	.2922	.2560
25	9 287	.3068	.3968
27	6 913	.3230	.3466
29	8 046	.3409	.4847
31	7 260	.3610	.5502
33	6 223	.3836	.6165
35	4 837	.4091	.6500
37	3 474	.4384	.6515
39	2 334	.4722	.6224
41	1 594	.5115	.6163
43	974	.5581	.5538
45	584	.6140	.4879
47	306	.6824	.3685
49	153	.7679	.2547
51	77	.8779	.1707
53	32	1.0249	.0914
55	17	1.2311	.0617
57	8	1.5418	.0376
59	4	2.0642	.0255
61	1	3.1339	.0095
63	2	6.7400	.0460
65	1		.3000

Table 7.7b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 8 - Firth of Forth
 Scottish length data

Sex : Females

Length	Removed	Delta T	F
17	1 430	.2557	.0231
19	2 089	.2668	.0352
21	4 418	.2789	.0784
23	6 236	.2922	.1184
25	8 512	.3068	.1733
27	6 996	1.0260	.0513
29	5 775	1.0994	.0516
31	4 632	1.1840	.0512
33	3 678	1.2828	.0512
35	2 303	1.3996	.0409
37	1 648	1.5397	.0378
39	1 029	1.7112	.0311
41	530	1.9256	.0214
43	289	2.2016	.0161
45	150	2.5701	.0119
47	70	3.0872	.0084
49	29	3.8664	.0057
51	16	5.1765	.0059
53	8	7.8589	.0075
55	2	16.9017	.0118
57	1		.3000

Table 7.8a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 9 - Moray Firth Sex : Males - 1
 Scottish length data

Length	Removed	Delta T (a)	F(a)
17	3 913	.2755	.0967
19	3 477	.2887	.0918
21	7 905	.3031	.2274
23	7 020	.3191	.2260
25	11 534	.3368	.4325
27	7 012	.3566	.3135
29	7 555	.3789	.4051
31	6 418	.4042	.4270
33	4 701	.4331	.3928
35	3 643	.4664	.3853
37	2 893	.5053	.3948
39	1 826	.5513	.3234
41	1 242	.6066	.2834
43	704	.6741	.2046
45	380	.7586	.1374
47	234	.8673	.1041
49	113	1.0124	.0616
51	61	1.2162	.0409
53	32	1.5231	.0270
55	19	2.0392	.0214
57	18	3.0959	.0309
59	9	6.6583	.0366
61	6		.3000

(a) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$

Table 7.8b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 9 - Moray Firth Sex : Males - 2
 Scottish length data

Length	Removed	Delta T (b)	F(b)
17	3 913	.2841	.1296
19	3 477	.2977	.1209
21	7 905	.3126	.2965
23	7 020	.3290	.2932
25	11 534	.3473	.5645
27	7 012	.3678	.4147
29	7 555	.3908	.5440
31	6 418	.4168	.5903
33	4 701	.4466	.5643
35	3 643	.4810	.5807
37	2 893	.5211	.6380
39	1 826	.5686	.5720
41	1 242	.6255	.5578
43	704	.6952	.4529
45	380	.7823	.3367
47	234	.8944	.2770
49	113	1.0441	.1725
51	61	1.2542	.1147
53	32	1.5707	.0725
55	19	2.1030	.0519
57	18	3.1927	.0643
59	9	6.8663	.0544
61	6		.3000

(b) with $K = 0.160$, $L_{\infty} = 62$ and $M = 0.2$

Table 7.8c. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 9 - Moray Firth
Scottish length data

Sex : Females - 1

Length	Removed	Delta T (c)	F(c)
17	2 333	.2755	.0031
19	2 837	.2887	.0039
21	8 471	.3031	.0121
23	11 668	.3191	.0172
25	14 759	1.1115	.0072
27	9 972	1.1910	.0058
29	7 771	1.2827	.0054
31	5 138	1.3897	.0043
33	3 722	1.5162	.0039
35	1 998	1.6681	.0026
37	1 372	1.8538	.0023
39	789	2.0861	.0018
41	407	2.3850	.0012
43	194	2.7842	.0009
45	104	3.3445	.0007
47	57	4.1886	.0007
49	19	5.6079	.0004
51	15	8.5138	.0009
53	14	18.3102	.0063
55	11		.3000

(c) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$ for immature ♀♀
 $K = 0.060$, $L_{\infty} = 56$ and $M = 0.2$ for mature ♀♀

Table 7.8d. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)

Management Unit : 9 - Moray Firth
Scottish length data

Sex : Females - 2

Length	Removed	Delta T (d)	F(d)
17	2 333	.2755	.0542
19	2 837	.2887	.0696
21	8 471	.3031	.2262
23	11 668	.3191	.3498
25	14 759	.6669	.2701
27	9 972	.7146	.2325
29	7 771	.7696	.2319
31	5 138	.8338	.1972
33	3 722	.9097	.1840
35	1 998	1.0008	.1259
37	1 372	1.1123	.1087
39	789	1.2516	.0786
41	407	1.4310	.0505
43	194	1.6705	.0299
45	104	2.0067	.0202
47	57	2.5131	.0144
49	19	3.3647	.0066
51	15	5.1083	.0083
53	14	10.9861	.0206
55	11		.3000

(d) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$ for immature ♀♀
 $K = 0.100$, $L_{\infty} = 56$ and $M = 0.2$ for mature ♀♀

Table 7.8e. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 9 - Moray Firth Sex : Females - 3
Scottish length data

Length	Removed	Delta T (e)	F(e)
17	2 333	.2755	.0668
19	2 837	.2887	.0839
21	8 471	.3031	.2666
23	11 668	.3191	.4057
25	14 759	1.1115	.1871
27	9 972	1.1910	.1618
29	7 771	1.2827	.1618
31	5 138	1.3897	.1378
33	3 722	1.5162	.1283
35	1 998	1.6681	.0871
37	1 372	1.8538	.0739
39	789	2.0861	.0520
41	407	2.3850	.0322
43	194	2.7842	.0181
45	104	3.3445	.0115
47	57	4.1886	.0076
49	19	5.6079	.0032
51	15	8.5138	.0034
53	14	18.3102	.0061
55	11		.3000

(e) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.2$ for immature ♀♀
 $K = 0.060$, $L_{\infty} = 56$ and $M = 0.1$ for mature ♀♀

Table 7.9a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 11 - North Minch Sex : Males
 Scottish length data

Length	Removed	Delta T	F
17	1 678	.2557	.0283
19	3 119	.2668	.0551
21	5 316	.2789	.0995
23	16 970	.2822	.3525
25	11 530	.3068	.2741
27	12 001	.3230	.3274
29	11 825	.3409	.3797
31	11 484	.3610	.4473
33	9 798	.3836	.4770
35	7 806	.4091	.4854
37	5 737	.4384	.4621
39	4 008	.4722	.4199
41	2 849	.5115	.3895
43	1 883	.5581	.3362
45	1 218	.6140	.2823
47	786	.6824	.2353
49	493	.7679	.1901
51	272	.8779	.1340
53	106	1.0249	.0653
55	66	1.2311	.0506
57	38	1.5418	.0375
59	29	2.0642	.0393
61	10	3.1339	.0210
63	6	6.7400	.0293
65	5		.3000

Table 7.9b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 11 - North Minch
 Scottish length data

Sex : Females

Length	Removed	Delta T	F
17	1 281	.2557	.0034
19	2 919	.2668	.0082
21	5 584	.2789	.0162
23	9 422	.2922	.0287
25	11 110	.3068	.0350
27	10 650	1.1115	.0108
29	9 579	1.1910	.0116
31	7 901	1.2827	.0115
33	6 392	1.3897	.0114
35	3 625	1.5162	.0080
37	2 152	1.6681	.0060
39	1 217	1.8538	.0044
41	570	2.0861	.0027
43	282	2.3850	.0019
45	152	2.7842	.0014
47	70	3.3445	.0010
49	35	4.1886	.0009
51	15	5.6079	.0007
53	6	8.5138	.0008
55	7	18.3102	.0069
57	5		.3000

Table 7.10a. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)

Management Unit : 12 - South Minch
Scottish length data

Sex : Males

Length	Removed	Delta T	F
17	3 645	.2485	.0620
19	3 880	.2588	.0695
21	8 500	.2701	.1630
23	12 750	.2824	.2697
25	16 322	.2958	.3957
27	13 388	.3106	.3809
29	13 888	.3270	.4732
31	11 616	.3452	.4873
33	9 510	.3655	.4994
35	7 742	.3883	.5190
37	6 290	.4142	.5527
39	4 623	.4438	.5455
41	3 451	.4780	.5600
43	2 307	.5179	.5254
45	1 430	.5650	.4581
47	906	.6216	.4072
49	572	.6908	.3623
51	362	.7774	.3268
53	205	.8888	.2656
55	118	1.0376	.2207
57	38	1.2464	.0996
59	22	1.5610	.0794
61	13	2.0899	.0693
63	4	3.1728	.0352
65	2	6.8237	.0450
67	1		.3000

Table 7.10b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 12 - South Minch
Scottish length data

Sex : Females

Length	Removed	Delta T	F
17	2 013	.2485	.0360
19	2 373	.2588	.0445
21	7 436	.2701	.1483
23	12 522	.2824	.2753
25	14 522	.2958	.3646
27	11 992	1.0756	.1078
29	9 881	1.1499	.1177
31	6 610	1.2351	.1063
33	4 884	1.3340	.1079
35	2 403	1.4502	.0731
37	1 455	1.5885	.0606
39	770	1.7560	.0442
41	411	1.9631	.0329
43	191	2.2255	.0217
45	95	2.5692	.0158
47	46	3.0387	.0118
49	20	3.7191	.0085
51	10	4.7947	.0080
53	4	6.7578	.0075
55	7	11.5525	.0730
57	1		.3000

Table 7.11a. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)

Management Unit : 13 - Clyde
Scottish length data

Sex : Males

Length	Removed	Delta T	F
17	3 681	.2273	.0886
19	4 892	.2359	.1247
21	8 977	.2451	.2475
23	7 889	.2551	.2394
25	11 536	.2660	.3943
27	11 796	.2778	.4711
29	11 355	.2908	.5452
31	10 647	.3049	.6353
33	7 697	.3206	.5803
35	6 076	.3379	.5806
37	4 475	.3572	.5459
39	3 249	.3789	.5064
41	2 291	.4034	.4552
43	1 709	.4312	.4332
45	1 152	.4632	.3721
47	828	.5003	.3395
49	589	.5438	.3076
51	450	.5957	.3028
53	307	.6585	.2698
55	207	.7361	.2394
57	156	.8346	.2434
59	115	.9634	.2545
61	74	1.1395	.2467
63	41	1.3946	.2189
65	24	1.7980	.2289
67	18		.3000

Table 7.11b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 13 - Clyde
Scottish length data

Sex : Females

Length	Removed	Delta T	F
17	1 783	.2273	.0191
19	3 384	.2359	.0378
21	10 412	.2451	.1225
23	11 073	.2551	.1395
25	13 025	.2660	.1773
27	13 143	.2778	.1928
29	9 340	1.0420	.0438
31	7 006	1.1115	.0400
33	5 093	1.1910	.0356
35	3 282	1.2827	.0284
37	2 380	1.3897	.0258
39	1 676	1.5162	.0230
41	1 092	1.6681	.0194
43	835	1.8538	.0196
45	526	2.0861	.0169
47	333	2.3850	.0152
49	222	2.7842	.0151
51	124	3.3445	.0135
53	72	4.1886	.0140
55	43	5.6079	.0181
57	24	8.5138	.0329
59	19		.3000

Table 7.12. - Selected output from the LCAs for the stocks around Scotland, using input parameters described in the stock-wise summary sheets (see Annex 1) :

* nos. attaining smallest length (in '000),
 * overall nos. in standing stock (in '000),
 * biomass of standing stock (in tonnes)

ratio = females figure/males figure

Sex	Numbers attaining smallest length	Numbers in standing stock	Biomass of standing stock
Firth of Forth			
♂	141.9	232.6	3 306
♀	252.8	899.3	17 839
ratio	1.8	3.9	5.4
Moray Firth			
♂	155.1	281.2	4 749
♀	2 878.4	12 940.7	211 671
ratio	18.6	46.0	44.6
North Minch			
♂	242.1	443.1	7 613
♀	1 511.4	6 491.6	135 297
ratio	6.2	14.6	17.8
South Minch			
♂	247.5	418.9	6 633
♀	234.3	659.9	12 015
ratio	0.9	1.6	1.8
Clyde			
♂	191.1	302.3	5 201
♀	425.0	1 490.5	34 564
ratio	2.2	4.9	6.6

Table 7.13a. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)
-

Management Unit : 14 - Irish Sea East Sex : Males
English length data

Length	Removed	Delta T	F
18	24	.3049	.0009
20	60	.3206	.0024
22	436	.3379	.0183
24	1 179	.3572	.0527
26	2 350	.3789	.1140
28	2 698	.4034	.1455
30	3 346	.4312	.2059
32	3 265	.4632	.2361
34	3 188	.5003	.2792
36	3 119	.5438	.3460
38	2 254	.5957	.3281
40	1 776	.6585	.3489
42	1 607	.7361	.4616
44	870	.8346	.3891
46	581	.9634	.4243
48	352	1.1395	.4771
50	209	1.3946	.7074
52	63		.5000

Table 7.13b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 14 - Irish Sea East Sex : Females
 English length data

Length	Removed	Delta T	F
18	5	.3049	.0006
20	21	.3206	.0027
22	139	.3379	.0188
24	674	.3572	.0976
26	1 334	.6899	.1199
28	1 553	.7411	.1662
30	1 437	.8004	.1906
32	1 261	.8701	.2154
34	900	.9531	.2037
36	578	1.0536	.1748
38	569	1.1778	.2430
40	458	1.3353	.3145
42	284	1.5415	.3664
44	148	1.8232	.4426
46	55	2.2314	.5275
48	14		.5000

Table 7.14a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 15 - Irish Sea West Sex : Males
 Northern Ireland and Rep. of Ireland length data

Length	Removed	Delta T	F(a)	F(b)	F(c)
10	28	.2551	.0002	.0001	.0001
12	213	.2660	.0012	.0010	.0009
14	925	.2778	.0052	.0046	.0040
16	6 628	.2908	.0377	.0339	.0300
18	20 001	.3049	.1180	.1072	.0962
20	31 847	.3206	.1999	.1837	.1668
22	63 879	.3379	.4525	.4194	.3838
24	84 288	.3572	.7452	.6925	.6345
26	71 141	.3789	.8563	.7937	.7236
28	53 786	.4034	.9320	.8578	.7740
30	32 357	.4312	.8220	.7492	.6667
32	22 821	.4632	.8586	.7724	.6755
34	15 367	.5003	.8987	.7907	.6728
36	7 491	.5438	.6747	.5774	.4762
38	3 942	.5957	.5088	.4255	.3425
40	2 654	.6585	.4784	.3914	.3086
42	1 420	.7361	.3511	.2816	.2186
44	893	.8346	.2931	.2324	.1793
46	276	.9634	.1123	.0897	.0701
48	526	1.1395	.2746	.2224	.1769
50	207	1.3946	.1478	.1214	.0987
52	211	1.7980	.2154	.1830	.1546
54	139	2.5342	.2584	.2295	.2045
56	70		.3000	.3000	.3000

(a) with M = 0.2
 (b) with M = 0.25
 (c) with M = 0.3

Table 7.14b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 15 - Irish Sea West Sex : Females
 Northern Ireland and Rep. of Ireland length data

Length	Removed	Delta T	F
10	13	.2551	.0001
12	270	.2660	.0016
14	2 244	.2778	.0134
16	10 054	.2908	.0612
18	27 122	.3049	.1730
20	50 718	.3206	.3559
22	76 511	.3379	.6409
24	88 537	.3572	.9984
26	53 533	.6899	.4918
28	28 893	.7411	.3910
30	14 605	.8004	.2760
32	11 052	.8701	.2872
34	4 473	.9531	.1556
36	2 318	1.0536	.1013
38	1 250	1.1778	.0671
40	934	1.3353	.0616
42	359	1.5415	.0292
44	289	1.8232	.0292
46	175	2.2314	.0228
48	99	2.8768	.0175
50	79	4.0547	.0213
52	39	6.9315	.0207
54	76		.3000

Table 7.15a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 16 - Porcupine Bank
 Spanish length data

Sex : Males

Length	Removed	Delta T	F
16	2	.2463	.0001
18	0	.2551	.0000
20	1	.2646	.0001
22	26	.2748	.0012
24	122	.2858	.0056
26	479	.2977	.0226
28	1 174	.3106	.0570
30	2 479	.3247	.1265
32	3 705	.3402	.2038
34	4 902	.3572	.3006
36	5 472	.3760	.3894
38	5 186	.3969	.4436
40	4 687	.4203	.4979
42	4 301	.4466	.5938
44	3 258	.4764	.6103
46	2 441	.5104	.6408
48	1 557	.5497	.5834
50	1 194	.5956	.6606
52	776	.6498	.6746
54	470	.7149	.6724
56	247	.7945	.5951
58	150	.8940	.6369
60	68	1.0221	.5359
62	33	1.1932	.4955
64	14	1.4334	.3977
66	7	1.7951	.4214
68	3		.4000

Table 7.15b. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)

Management Unit : 16 - Porcupine Bank
Spanish length data

Sex : Females

Length	Removed	Delta T	F
18	1	.3049	.0002
20	3	.3206	.0007
22	36	.3379	.0080
24	141	.3572	.0321
26	466	.3789	.1108
28	717	.4034	.1833
30	1 015	.4312	.2915
32	1 309	.4632	.4523
34	1 264	.5003	.5687
36	1 030	.5438	.6498
38	683	.5957	.6352
40	426	.6585	.5980
42	265	.7361	.5756
44	127	.8346	.4176
46	70	.9634	.3377
48	59	1.1395	.4401
50	48		.3000

Table 7.16a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 20+21+22 - Celtic Sea Sex : Males
French length data

Length	Removed	Delta T	F
20	19	.3547	.0001
22	219	.3704	.0015
24	895	.3877	.0064
26	4 133	.4066	.0319
28	14 493	.4274	.1245
30	14 646	.4506	.1444
32	20 009	.4763	.2342
34	16 803	.5052	.2414
36	13 144	.5378	.2348
38	10 084	.5749	.2264
40	7 540	.6176	.2149
42	5 643	.6670	.2067
44	3 476	.7251	.1641
46	2 722	.7943	.1671
48	1 962	.8780	.1605
50	1 358	.9815	.1518
52	950	1.1128	.1502
54	596	1.2846	.1390
56	356	1.5193	.1289
58	179	1.8595	.1071
60	86	2.3974	.0933
62	11	3.3789	.0235
64	4	5.7762	.0219
66	5		.2000

Table 7.16b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 20+21+22 - Celtic Sea Sex : Females
 French length data

Length	Removed	Delta T	F
20	3	.4203	.0000
22	85	.4527	.0009
24	320	.4905	.0037
26	1 144	.5351	.0141
28	4 536	.5887	.0613
30	4 072	.6543	.0620
32	3 757	.7363	.0655
34	3 115	.8418	.0633
36	2 397	.9827	.0580
38	1 704	1.1804	.0503
40	1 061	1.4783	.0395
42	634	1.9792	.0315
44	426	3.0049	.0319
46	227	6.4624	.0387
48	121		.2000

Table 7.17a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 23+24 - Bay of Biscay Sex : Males
French length data

Length	Removed	Delta T	F
14	99	.2981	.0006
16	3 075	.3082	.0181
18	13 875	.3190	.0884
20	35 985	.3306	.2581
22	47 869	.3431	.4095
24	36 601	.3566	.3845
26	36 853	.3711	.4859
28	31 487	.3869	.5419
30	24 256	.4041	.5595
32	16 678	.4229	.5202
34	12 256	.4435	.5198
36	8 907	.4663	.5219
38	5 806	.4915	.4727
40	3 917	.5196	.4424
42	2 513	.5511	.3929
44	1 803	.5867	.3926
46	1 234	.6272	.3813
48	759	.6737	.3349
50	537	.7277	.3432
52	308	.7910	.2889
54	210	.8665	.2934
56	167	.9578	.3764
58	109	1.0708	.4526
60	58	1.2139	.5190
62	17	1.4014	.3421
64	14		.5000

Table 7.17b. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)

Management Unit : 23+24 - Bay of Biscay
French length data

Sex : Females

Length	Removed	Delta T	F
16	1 397	.3664	.0095
18	11 936	.3862	.0881
20	27 760	.4083	.2329
22	35 174	.4330	.3574
24	31 059	.4610	.4017
26	24 087	.4928	.4077
28	18 141	.5293	.4106
30	10 346	.5717	.3119
32	4 998	.6215	.1926
34	2 813	.6808	.1337
36	1 606	.7526	.0928
38	1 112	.8413	.0781
40	697	.9538	.0601
42	356	1.1011	.0380
44	300	1.3023	.0408
46	239	1.5939	.0436
48	155	2.0549	.0409
50	65	2.8962	.0278
52	37	4.9511	.0339
54	55		.4000

Table 7.18a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
 (where available) in numbers (in '000),
 * delta T, i.e. the time taken to grow from
 one length to the next, and
 * annualized fishing mortality (F),
 at length (carapace length in mm)

Management Unit : 25 - North Galicia
 Spanish length data

Sex : Males

Length	Removed	Delta T	F
18	1	.2732	.0002
20	4	.2825	.0010
22	26	.2924	.0068
24	91	.3031	.0243
26	288	.3145	.0803
28	622	.3268	.1856
30	956	.3402	.3188
32	1 128	.3547	.4413
34	1 116	.3704	.5365
36	1 129	.3877	.7077
38	698	.4066	.5838
40	645	.4274	.7334
42	505	.4506	.8388
44	288	.4763	.7112
46	228	.5052	.8593
48	162	.5378	1.0409
50	57	.5749	.6082
52	32	.6176	.4980
54	15	.6670	.3195
56	6	.7251	.1595
58	6	.7943	.1939
60	3	.8780	.1180
62	1	.9815	.0456
64	3	1.1128	.1669
66	1	1.2846	.0704
68	1	1.5193	.0881
70	4		.4000

Table 7.18b. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)

Management Unit : 25 - North Galicia
Spanish length data

Sex : Females

Length	Removed	Delta T	F
22	33	.3175	.0125
24	177	.3334	.0698
26	348	.3510	.1452
28	733	.3705	.3404
30	741	.3923	.4042
32	849	.4168	.5760
34	677	.4446	.6052
36	591	.4764	.7349
38	361	.5131	.6469
40	240	.5559	.6188
42	174	.6065	.6717
44	83	.6672	.4770
46	77	.7415	.6848
48	43	.8344	.6902
50	14	.9540	.3820
52	9	1.1137	.3978
54	3	1.3378	.1570
56	3	1.6754	.2968
58	1	2.2431	.1638
60	1		.4000

Table 7.19a. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 26 - West Galicia Sex : Males
Spanish length data

Length	Removed	Delta T	F
10	15	.5749	.0008
15	153	.6176	.0081
20	820	.6670	.0468
25	2 749	.7251	.1796
30	4 564	.7943	.3943
35	3 989	.8780	.5443
40	1 872	.9815	.4331
45	776	1.1128	.2838
50	283	1.2846	.1470
55	170	1.5193	.1189
60	82	1.8595	.0773
65	76	2.3974	.1033
70	51	3.3789	.1211
75	27	5.7762	.1914
80	5		.4000

Table 7.19b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 26 - West Galicia Sex : Females
Spanish length data

Length	Removed	Delta T	F
10	5	.5801	.0001
15	133	.6354	.0161
20	826	.7024	.1081
25	2 333	.7852	.3809
30	2 767	.8902	.7543
35	1 168	1.0277	.6540
40	478	1.2155	.5549
45	196	1.4876	.4916
50	78	1.9179	.4811
55	16	2.7031	.2446
60	2	4.6210	.0654
65	3		.4000

Table 7.20a. - Outputs from Length Cohort Analysis of

- * removals, i.e. landings + dead discards (where available) in numbers (in '000),
 - * delta T, i.e. the time taken to grow from one length to the next, and
 - * annualized fishing mortality (F),
- at length (carapace length in mm)

Management Unit : 28+29 - SW and S Portugal Sex : Males
 Portuguese length data

Length	Removed	Delta T	F
18	7	.1961	.0016
20	34	.2041	.0076
22	104	.2128	.0232
24	736	.2223	.1676
26	1 337	.2326	.3220
28	2 242	.2440	.6029
30	1 640	.2565	.5066
32	1 315	.2703	.4614
34	1 414	.2858	.5729
36	1 233	.3031	.5930
38	966	.3227	.5560
40	822	.3450	.5710
42	661	.3705	.5622
44	621	.4002	.6694
46	377	.4351	.5208
48	279	.4766	.4845
50	190	.5268	.4130
52	169	.5889	.4698
54	191	.6677	.7864
56	92	.7708	.6287
58	60	.9116	.7197
60	24	1.1157	.5428
62	9	1.4384	.3586
64	6	2.0273	.4989
66	2		.5000

Table 7.20b. - Outputs from Length Cohort Analysis of

* removals, i.e. landings + dead discards
(where available) in numbers (in '000),
* delta T, i.e. the time taken to grow from
one length to the next, and
* annualized fishing mortality (F),
at length (carapace length in mm)

Management Unit : 28+29 - SW and S Portugal Sex : Females
Portuguese length data

Length	Removed	Delta T	F
10	6	.1695	.0015
12	0	.1755	.0000
14	0	.1818	.0000
16	0	.1887	.0000
18	8	.1961	.0019
20	62	.2041	.0151
22	210	.2128	.0515
24	966	.2223	.2445
26	1 833	.2326	.4992
28	2 127	.8172	.1997
30	1 653	.8653	.1876
32	2 024	.9194	.2928
34	1 786	.9808	.3633
36	1 057	1.0509	.3131
38	951	1.1318	.4381
40	341	1.2262	.2444
42	234	1.3378	.2379
44	181	1.4718	.2758
46	69	1.6357	.1542
48	74	1.8406	.2477
50	12	2.1044	.0576
52	9	2.4567	.0527
54	8	2.9510	.0594
56	13	3.6958	.1542
58	4	4.9481	.0915
60	2	7.5121	.1016
62	1		.5000

Table 7.21a.- Annualized fishing mortalities of male and female Nephrops, averaged across the lower 75 % of the length range

Management Units in ICES Sub-areas III, IV, V and VI

Management Unit(s)	Males	Females
1 Iceland	0.17	..
2 Faroe Islands	0.11	0.18
3 Skagerrak	Not assessed	
4 Kattegat	Not assessed	
5 Botney Gut	0.18	0.07
6 Farn Deepes	0.52	0.14
7 Fladen	0.27	0.18
8 Firth of Forth	0.40	0.05
9 Moray Firth	0.27 (a)	0.005 (c)
	0.42 (b)	0.15 (d)
		0.13 (e)
10 Noup	Not assessed	
11 North Minch	0.29	0.01
12 South Minch	0.38	0.10
13 Clyde	0.38	0.06

- (a) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$
 (b) with $K = 0.160$, $L_{\infty} = 62$ and $M = 0.2$
 (c) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$ for immature ♀♀
 $K = 0.060$, $L_{\infty} = 56$ and $M = 0.2$ for mature ♀♀
 (d) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$ for immature ♀♀
 $K = 0.100$, $L_{\infty} = 56$ and $M = 0.2$ for mature ♀♀
 (e) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.2$ for immature ♀♀
 $K = 0.060$, $L_{\infty} = 56$ and $M = 0.1$ for mature ♀♀

Table 7.21b.- Annualized fishing mortalities of male and female Nephrops, averaged across the lower 75 % of the length range

Management Units in ICES Sub-areas VII, VIII, IX and X

Management Unit(s)	Males	Females
14 Irish Sea East	0.21	0.15
15 Irish Sea West	0.46 (a) 0.41 (b) 0.35 (c)	0.24 (a)
16 Porcupine Bank	0.32	0.32
17 Aran Islands	Not assessed	
18+19 Irish coast	Not assessed	
20+21+22 Celtic Sea	0.14	0.04
23+24 Bay of Biscay	0.37	0.19
25 North Galicia	0.43	0.47
26 West Galicia	0.20	0.38
27 N Portugal	Not assessed	
28+29 S and SW Portugal	0.44	0.19
30 Gulf of Cadiz	Not assessed	

- (a) with $M = 0.2$
(b) with $M = 0.25$
(c) with $M = 0.3$

Table 7.22. - Iceland (Management Unit 1) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 80 mm to 90 mm

Sex	80 -> 90 mm		
	Land 1 yr	Land LT	Biom LT
♂	- 16	≈ 0	+ 15
♀	no mesh assessment for ♀♀		

Table 7.23. - Botney Gut and Silver Pit (Managem. Unit 5) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 80 and 90 mm

Sex	70 -> 80 mm			70 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 8	≈ 0	+ 9	- 18	- 3	+ 19
♀	- 13	- 6	+ 8	- 26	- 15	+ 15

Table 7.24. - Farn Deep (Management Unit 6) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 80 and 90 mm

Sex	70 -> 80 mm			70 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	≈ 0	+ 21	+ 28	- 6	+ 37	+ 60
♀	- 15	+ 3	+ 20	- 30	- 1	+ 40

Table 7.25. - Fladen (Management Unit 7) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 60, 80 and 90 mm

Sex	70 -> 60 mm			70 -> 80 mm			70 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	+ 11	- 2	- 22	- 18	- 1	+ 31	- 39	- 8	+ 70
♀	+ 24	+ 3	- 27	- 28	- 9	+ 38	- 54	- 25	+ 84

Table 7.26. - Firth of Forth (Management Unit 8) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 80 and 90 mm

Sex	70 -> 80 mm			70 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 7	+ 9	+ 27	- 17	+ 13	+ 58
♀	- 20	- 15	+ 9	- 37	- 30	+ 17

Table 7.27. - Moray Firth (Management Unit 9) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 80 and 90 mm

Sex	70 -> 80 mm			70 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂ (a)	- 10	+ 3	+ 27	- 23	≈ 0	+ 56
♂ (b)	- 6	+ 16	+ 37	- 16	+ 26	+ 84
♀ (c)	- 23	- 23	+ 1	- 41	- 41	+ 2
♀ (d)	- 18	- 4	+ 27	- 34	- 13	+ 52
♀ (e)	- 17	≈ 0	+ 36	- 34	- 7	+ 71

(a) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$

(b) with $K = 0.160$, $L_{\infty} = 62$ and $M = 0.2$

(c) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$ for immature ♀♀

$K = 0.060$, $L_{\infty} = 56$ and $M = 0.2$ for mature ♀♀

(d) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.3$ for immature ♀♀

$K = 0.100$, $L_{\infty} = 56$ and $M = 0.2$ for mature ♀♀

(e) with $K = 0.165$, $L_{\infty} = 62$ and $M = 0.2$ for immature ♀♀

$K = 0.060$, $L_{\infty} = 56$ and $M = 0.1$ for mature ♀♀

Table 7.28. - North Minch (Management Unit 11) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 80 and 90 mm

Sex	70 -> 80 mm			70 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 9	+ 4	+ 25	- 21	+ 3	+ 52
♀	- 22	- 21	+ 2	- 40	- 39	+ 4

Table 7.29. - South Minch (Management Unit 12) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 80 and 90 mm

Sex	70 -> 80 mm			70 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 8	+ 8	+ 25	- 18	+ 12	+ 53
♀	- 20	- 11	+ 18	- 37	- 24	+ 34

Table 7.30. - Clyde (Management Unit 13) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 80 and 90 mm

Sex	70 -> 80 mm			70 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 7	+ 8	+ 28	- 17	+ 13	+ 60
♀	- 20	- 16	+ 9	- 37	- 31	+ 16

Table 7.31. - Irish Sea East (Management Unit 14) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 70 mm to 75, 80 and 85 mm

Sex	70 -> 75 mm			70 -> 80 mm			70 -> 85 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 4	+ 2	+ 6	- 10	+ 2	+ 12	- 15	+ 2	+ 18
♀	- 7	+ 3	+ 8	- 14	+ 4	+ 17	- 21	+ 4	+ 25

Table 7.32. - Irish Sea West (Management Unit 15) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 68 mm to 75, 80 and 85 mm

Sex	68 -> 75 mm			68 -> 80 mm			68 -> 85 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂ (a)	- 3	+ 14	+ 33	- 8	+ 22	+ 62	- 14	+ 28	+ 94
♂ (b)	- 4	+ 10	+ 31	- 10	+ 15	+ 56	- 17	+ 18	+ 84
♂ (c)	- 6	+ 7	+ 28	- 13	+ 8	+ 50	- 20	+ 8	+ 73
♀ (a)	- 13	+ 3	+ 41	- 23	≈ 0	+ 72	- 32	- 4	+102

(a) with M = 0.2
 (b) with M = 0.25
 (c) with M = 0.3

Table 7.33. - Porcupine Bank (Management Unit 16) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 74 mm to 80 and 85 mm

Sex	74 -> 80 mm			74 -> 85 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 7	+ 5	+ 16	- 13	+ 7	+ 28
♀	- 10	+ 3	+ 22	- 16	+ 3	+ 36

Table 7.34. - Celtic Sea (Management Units 20, 21 and 22) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 80 mm to 85 and 90 mm

Sex	80 -> 85 mm			80 -> 90 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 9	- 2	+ 10	- 18	- 5	+ 18
♀	- 12	- 10	+ 2	- 24	- 21	+ 6

Table 7.35. - Bay of Biscay (Management Units 23 and 24) :
% increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 50 mm to 55, 60 and 65 mm

Sex	50 -> 55 mm			50 -> 60 mm			50 -> 65 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 4	+ 9	+ 17	- 10	+ 16	+ 37	- 17	+ 21	+ 57
♀	- 8	≈ 0	+ 18	- 18	- 5	+ 37	- 29	- 11	+ 55

Table 7.36. - North Galicia (Management Unit 26) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 40 mm to 55, 60 and 65 mm

Sex	40 -> 55 mm			40 -> 60 mm			40 -> 65 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 5	+ 5	+ 14	- 8	+ 7	+ 22	- 12	+ 9	+ 32
♀	- 7	+ 5	+ 20	- 12	+ 7	+ 31	- 16	+ 9	+ 44

Table 7.37. - West Galicia (Management Unit 26) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 40 mm to 55, 60 and 65 mm

Sex	40 -> 55 mm			40 -> 60 mm			40 -> 65 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 6	+ 6	+ 21	- 9	+ 8	+ 32	- 13	+ 10	+ 45
♀	- 5	+ 11	+ 30	- 8	+ 15	+ 46	- 12	+ 19	+ 63

Table 7.38. - SW and S Portugal (Managem. Units 28 and 29) : % increments in landings after 1 year, landings long-term and biomass long-term, at status quo effort, upon mesh changes from 50 mm to 55 and 65 mm

Sex	50 -> 55 mm			50 -> 65 mm		
	Land 1 yr	Land LT	Biom LT	Land 1 yr	Land LT	Biom LT
♂	- 2	+ 4	+ 8	- 7	+ 12	+ 29
♀	- 5	+ 2	+ 10	- 18	+ 6	+ 38

Table 7.39. - Unofficial percentage uptake figures for EC Nephrops TACs, 1986-89

TAC area	% uptake				
	1986	1987	1988	1989	Average 86-88
Vb+VI	77	72	79	68 (*)	76
VII	66	74	60	55 (*)	67
VIIIa,b	50	60	68	74 (*)	59
VIIIc	103	100	91	95 (*)	98
IIId,e	0	34	0	2 (*)	11
IX+X	85	84	64	26 (*)	78

(*) provisional

Table 7.40a.- Proposed TAC areas, together with present ones (if relevant), management units included, and landings options (in tonnes/year) (**)

Management Units in ICES Sub-areas III, IV, V, VI and VII

Proposed TAC area	Present TAC area	Management Units included	Landings options		
			Maximum	Mean + sd	Mean
Va	---	1	Managed by national TACs		
Vb(non EC)	---	2	Managed by national TACs		
Vb(EC)+VI	Vb(EC)+VI	11+12+13	13 530 (*)	12 760 (*)	10 700 (*)
IIia	---	3+4	4 420	4 360	3 900
IVa rectangles 47E6 + 45E6-7 + 44E6-8	---	9+10	2 690 (*)	2 310 (*)	1 700 (*)
IVa rest of ..	---	7	2 370 (*)	1 770 (*)	1 110 (*)
IVb,c E of 1° E	---	5	770 (*)	710 (*)	580 (*)
IVb,c W of 1° E	---	6+8	6 000 (*)	5 330 (*)	4 270 (*)
VIIa	VII	14+15	9 960 (*)	9 840 (*)	8 640 (*)
VII d,e	VII	none	Zero TAC to prevent misreporting		
VII b,c,k + VII j W of 10° W	VII	16+17+18+19	6 400 (*)	5 600 (*)	4 260 (*)
VII f,g,h + VII j E of 10° W	VII	20+21+22	3 830	3 790	3 360

Table 7.40b.- Proposed TAC areas, together with present ones (if relevant), management units included, and landings options (in tonnes/year) (**)

Management Units in ICES Sub-areas VIII, IX and X

Proposed TAC area	Present TAC area	Management Units included	Landings options		
			Maximum	Mean + sd	Mean
VIIIa,b	VIIIa,b	23+24	6 220	5 940	5 190
VIIIc	VIIIc	25	590 (*)	560 (*)	490 (*)
VIIId,e	VIIId,e	none	Zero TAC to prevent misreporting		
IX	IX+X	26+27+28+ 29+30	2 640 (*)	2 300 (*)	1 750 (*)
X	IX+X	none	Zero TAC to prevent misreporting		

(*) See comments to corresponding text tables in Sections 7.2. - 7.20.

(**) All figures "rounded up" to the nearest 10 tonnes

Table 8.1a.- Legal minimum mesh sizes for Nephrops and finfish, current Nephrops mesh sizes, legal minimum landing sizes (MLS) and L₂₅, as predicted by current mesh selectivity parameters (in mm)

Management Units in ICES Sub-areas III, IV, V and VI, and Division VIIa

MU	Minimum mesh size		Nephrops mesh in use	MLS	L ₂₅
	Nephrops	Finfish			
1	80	120-155	80	30	34
2	..	creel fishery	..	150 (a)	..
3	70	80-100	70	40	≈ 30
4	70	80-100	70	40	≈ 30
5	70	90	70	25	22
6	70	90	70-80	25	22
7	70	90	70	25	21
8	70	90	70	25	21
9	70	90	70	25	21
10	70	90	70	25	21
11	70	90	70	20	21
12	70	90	70	20	21
13	70	90	70	20	21
14	70	70	70-80	20	23
15	70	70	65 (Irl) 70 (NI)	20	23

(a) total length (in mm)

Table 8.1b.- Legal minimum mesh sizes for Nephrops and finfish, current Nephrops mesh sizes, legal minimum landing sizes (MLS) and L₂₅, as predicted by current mesh selectivity parameters (in mm)

Management Units in ICES Sub-areas VII (except Divison VIIa), VIII and IX

MU	Minimum mesh size		Nephrops mesh in use	MLS	L ₂₅
	Nephrops	Finfish			
16	70	80	74-80 (Sp) 80 (Fr)	25	30
17	70	80	65 (Irl) 80 (Fr)	25	?
18	70	80	?	25	?
19	70	80	?	25	?
20	70	80	80	25	31.5 (b)
21	70	80	80	25	31.5 (b)
22	70	80	80	25	31.5 (b)
23	55	65	50 (c)	20	21.5 (d)
24	55	65	50 (c)	20	21.5 (d)
25	55	65	40	20	19 (d)
26	55	65	40	20	19 (d)
27	55	65	50	20	17.5
28	55	65	50	20	17.5
29	55	65	50	20	17.5
30	55	65	40	20	?

(b) for 80 mm mesh

(c) 55 mm from April 1st, 1990 onwards

(d) for 55 mm mesh